

PROFILE SHEET **Physics**

Publisher: Holt, Rinehart and Winston
Text/Instructional Material Title: Holt Physics, 2004

Science Standard	Rating		
	Adequate	Limited	No Evidence
PH.1	✓		
PH.2	✓		
PH.3	✓		
PH.4	✓		
PH.5	✓		
PH.6	✓		
PH.7	✓		
PH.8	✓		
PH.9	✓		
PH.10	✓		
PH.11	✓		
PH.12	✓		
PH.13	✓		
PH.14	✓		
Additional Criteria			
PH-AC.1	✓		
PH-AC.2	✓		
PH-AC.3	✓		
PH-AC.4	✓		
PH-AC.5	✓		

The Virginia Department of Education recommends to the Board of Education:

YES ✓

NO

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Science Standard	Rating Scale Please indicate the rating for each by placing a check mark (✓) in the appropriate cell.		
	Adequate	Limited	No Evidence
PH.1 The student will plan and conduct investigations in which			
a) the components of a system are defined;	✓		
b) instruments are selected and used to extend observations and measurements of mass, volume, temperature, heat exchange, energy transformations, motion, fields, and electric charge;	✓		
c) information is recorded and presented in an organized format;	✓		
d) metric units are used in all measurements and calculations;	✓		
e) the limitations of the experimental apparatus and design are recognized;	✓		
f) the limitations of measured quantities through the appropriate use of significant figures or error ranges are recognized;	✓		
g) data gathered from non-SI instruments are incorporated through appropriate conversions; and	✓		
h) appropriate technology, including computers, graphing calculators, and probeware is used for gathering and analyzing data and communicating results.	✓		
Overall Rating for Standard	✓		

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	Adequate	Limited	No Evidence
PH.2 The student will investigate and understand how to analyze and interpret data. Key concepts include			
a) a description of a physical problem is translated into a mathematical statement in order to find a solution;	✓		
b) relationships between physical quantities are determined using the shape of a curve passing through experimentally obtained data;	✓		
c) the slope of a linear relationship is calculated and includes appropriate units;	✓		
d) interpolated, extrapolated, and analyzed trends are used to make predictions; and	✓		
e) analysis of systems employs vector quantities utilizing trigonometric and graphical methods.	✓		
Overall Rating for Standard	✓		

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	Adequate	Limited	No Evidence
PH.3 The student will investigate and understand how to demonstrate scientific reasoning and logic. Key concepts include			
a) analysis of scientific sources to develop and refine research hypotheses;	✓		
b) analysis of how science explains and predicts relationships;	✓		
c) evaluation of evidence for scientific theories;	✓		
d) examination of how new discoveries result in modification of existing theories or establishment of new paradigms; and	✓		
e) construction and defense of a scientific viewpoint (the nature of science).	✓		
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	Adequate	Limited	No Evidence
PH.4 The student will investigate and understand how applications of physics affect the world. Key concepts include			
a) examples from the real world; and	✓		
b) exploration of the roles and contributions of science and technology.	✓		
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	Adequate	Limited	No Evidence
PH.5 The student will investigate and understand the interrelationships among mass, distance, force, and time through mathematical and experimental processes. Key concepts include			
a) linear motion;	✓		
b) uniform circular motion;	✓		
c) projectile motion;	✓		
d) Newton's laws of motion;	✓		
e) gravitation;	✓		
f) planetary motion; and		✓	
g) work, power, and energy.	✓		
Overall Rating for Standard	✓		

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Science Standard	Rating Scale Please indicate the rating for each by placing a check mark (✓) in the appropriate cell.		
	Adequate	Limited	No Evidence
PH.6 The student will investigate and understand that quantities including mass, energy, momentum, and charge are conserved. Key concepts include			
a) kinetic and potential energy;	✓		
b) elastic and inelastic collisions; and	✓		
c) electric power.	✓		
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	Adequate	Limited	No Evidence
PH.7 The student will investigate and understand properties of fluids. Key concepts include			
a) density and pressure;	✓		
b) variation of pressure with depth;	✓		
c) Archimedes' principle of buoyancy;	✓		
d) Pascal's principle;	✓		
e) fluids in motion; and	✓		
f) Bernoulli's principle.	✓		
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	Adequate	Limited	No Evidence
PH.8 The student will investigate and understand that energy can be transferred and transformed to provide usable work. Key concepts include			
a) transformation of energy among forms, including mechanical, thermal, electrical, gravitational, chemical, and nuclear; and	✓		
b) efficiency of systems.	✓		
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	Adequate	Limited	No Evidence
PH.9 The student will investigate and understand how to use models of transverse and longitudinal waves to interpret wave phenomena. Key concepts include			
a) wave characteristics (period, wavelength, frequency, amplitude and phase);	✓		
b) fundamental wave processes (reflection, refraction, diffraction, interference, polarization, Doppler effect); and	✓		
c) light and sound in terms of wave models.	✓		
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	Adequate	Limited	No Evidence
PH.10 The student will investigate and understand that different frequencies and wavelengths in the electromagnetic spectrum are phenomena ranging from radio waves through visible light to gamma radiation. Key concepts include			
a) the properties and behaviors of radio, microwaves, infrared, visible light, ultraviolet, X-rays, and gamma rays; and	✓		
b) current applications based on the wave properties of each band.	✓		
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	Adequate	Limited	No Evidence
PH.11 The student will investigate and understand how light behaves in the fundamental processes of reflection, refraction, and image formation in describing optical systems. Key concepts include			
a) application of the laws of reflection and refraction;	✓		
b) construction and interpretation of ray diagrams;	✓		
c) development and use of mirror and lens equations; and	✓		
d) predictions of type, size, and position of real and virtual images.	✓		
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	Adequate	Limited	No Evidence
PH.12 The student will investigate and understand how to use the field concept to describe the effects of gravitational, electric, and magnetic forces. Key concepts include			
a) inverse square laws (Newton's law of universal gravitation and Coulomb's law); and	✓		
b) operating principles of motors, generators, transformers, and cathode ray tubes.	✓		
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	Adequate	Limited	No Evidence
PH.13 The student will investigate and understand how to diagram and construct basic electrical circuits and explain the function of various circuit components. Key concepts include			
a) Ohm's law;	✓		
b) series, parallel, and combined circuits; and	✓		
c) circuit components including resistors, batteries, generators, fuses, switches, and capacitors.	✓		
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	Adequate	Limited	No Evidence
PH.14 The student will investigate and understand that extremely large and extremely small quantities are not necessarily described by the same laws as those studied in Newtonian physics. Key concepts include			
a) wave/particle duality;	✓		
b) wave properties of matter;	✓		
c) matter/energy equivalence;	✓		
d) quantum mechanics and uncertainty;	✓		
e) relativity;	✓		
f) nuclear physics;	✓		
g) solid state physics;	✓		
h) superconductivity; and	✓		
i) radioactivity.	✓		
Overall Rating for Standard	✓		

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Additional Criteria	Rating Scale Please indicate the rating for each by placing a check mark (✓) in the appropriate cell.		
	Adequate	Limited	No Evidence
1. Safe use of materials and equipment is encouraged.	✓		
Overall Rating for Additional Criteria 1	✓		
2. Materials emphasize the use of effective instructional practices and learning theories. <ul style="list-style-type: none"> • Students are guided through different approaches such as the learning cycle. • Students are provided the opportunity to conduct scientific inquiry appropriate for their age, grade, and maturity. • Concepts are introduced through concrete experiences. • Students are required to use manipulative materials during investigations and activities. • Multiple opportunities are provided for students to apply concepts. • Learning activities offer opportunities for students to revise their prior knowledge and create new knowledge. • Students are encouraged to pose questions and to identify problems, as well as propose multiple solutions and design and conduct tests of inference. • Students collect and interpret data through a variety of technologies and draw conclusions based on that data. 	✓		
Overall Rating for Additional Criteria 2	✓		

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Additional Criteria	Rating Scale Please indicate the rating for each by placing a check mark (✓) in the appropriate cell.		
	Adequate	Limited	No Evidence
3. Materials present content in an accurate, unbiased manner, and are based on sound science. <ul style="list-style-type: none"> Materials do not contain content errors (omissions of current content, out-of-date content, overgeneralizations, etc.).* Materials do not contain production errors (misspelled words, word omissions, incorrect answers).* Diverse groups (racial, ethnic, cultural, linguistic), males and females, people with disabilities, and people of all ages are represented appropriately. The materials are free of non-scientific explanation. 	✓		
Overall Rating for Additional Criteria 3	✓		

*Please note that the Department of Education does not certify that all inaccuracies and/or grammatical errors have been detected in this instructional item and reported in this correlation profile.

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	Adequate	Limited	No Evidence
4. Materials promote student assessment as an integral part of the instructional process. <ul style="list-style-type: none"> Assessment suggestions and scoring criteria for student performances on work such as lab practicals or tasks, concept maps, research projects, observation checklists, etc., are provided. Assessment items include multiple-choice, short answer, essay and open-ended questions with charts, graphs, and diagrams imbedded within the items. Options include techniques for assessing students' prior knowledge. Assessment items reflect the rigor and the intent of the standards. For example, they require students to use higher order thinking skills to apply, analyze, synthesize, evaluate, and make judgments or recommendations. 	✓		
Overall Rating for Additional Criteria 4	✓		

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	Adequate	Limited	No Evidence
5. Materials are presented in an organized, logical manner and are appropriate for the age, grade, and maturity of the students. <ul style="list-style-type: none"> • Materials are organized appropriately within and among units of study. • Format design includes titles, subheadings, and appropriate cross-referencing for ease of use. • Writing style, length of sentences, and vocabulary are appropriate. • Graphics and illustrations are appropriate. • Level of abstraction is appropriate, and real life examples, including careers are provided. • Sufficient applications are provided to promote depth of understanding. 	✓		
Overall Rating for Additional Criteria 5	✓		